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ADJECTIVES AS NOUN PHRASES.

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THIS ANALYSIS OF UNDERLYING SYNTACTIC STRUCTURE IS BASED ON THE ASSUMPTION THAT THE PARTS OF SPEECH CALLED "VERBS" AND "ADJECTIVES" ARE TWO SUBCATEGORIES OF ONE MAJOR LEXICAL CATEGORY, "PREDICATE." FROM THIS ASSUMPTION, THE HYPOTHESIS IS ADVANCED THAT, IN LANGUAGES EXHIBITING THE COPULA, THE DEEP STRUCTURE OF SENTENCES CONTAINING PREDICATE ADJECTIVES IS IDENTICAL IN ALL SIGNIFICANT RESPECTS TO THAT OF SENTENCES WITH PREDICATES CONTAINING VERBS. THIS IMPLIES THE CLAIMS THAT "BE" IS A TRUE VERB AND THAT IT HAS A DEEP STRUCTURE SIMILAR TO SUCH LEXICAL ITEMS AS "TRY," AND "KNOW." SIX ARGUMENTS FROM WIDELY VARYING AREAS OF SYNTAX ARE USED TO SUPPORT THE HYPOTHESIS. THIS PAPER WAS PRESENTED AT THE WINTER MEETING OF THE LINGUISTIC SOCIETY OF AMERICA (NEW YORK, DECEMBER 28, 1966). (KL)

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ADJECTIVES AS NOUN PHRASES[1]

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December, 1966

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Recent research into the nature of underlying syntactic structure by Paul Postal and by George Lakoff has indicated that the parts of speech which have traditionally been called verbs and adjectives should really be looked upon as two subcategories of one major lexical category, predicate. Some of the facts that lead to this conclusion are given in (1).

(1) a. There are transitive verbs such as (bring, trust to, depend on, etc.) and intransitive verbs such as (sleep, billow, elapse, etc.); similarly, there are transitive adjectives such as (fond of, wild about, mad at, etc.) and intransitive adjectives such as (dead, red, absurd, etc.).

b. Some verbs such as (know, hope, read, etc.) require animate subjects (The wrestler hoped for a quick victory, but not *The driveway hoped for a quick victory), while other verbs (such as elapse, entail, subtend, etc.) exclude animate subjects (Two weeks elapsed but not * My Latin teacher elapsed). Similarly, some adjectives (such as despondent, aware, contrite, etc.) require animate subjects (The wrestler was despondent but not *the driveway was despondent), while others (such as valid, moot, gibbous, etc.) exclude animate subjects (Your argument is valid but not *Your nephew is valid).

c. Some verbs (such as jump, kick, build, etc.) can occur in imperative sentences, others (such as resemble, inherit, doubt, etc.) cannot (Jump over it! but not *Resemble Jonathan!). Similarly, some adjectives (such as polite, honest, reasonable, etc.) can occur in imperatives, while others (such as swarthy, fat, pregnant, etc.) cannot (Be polite! but not *Be swarthy!)

These facts, and there are many others like them, constitute part of the evidence for the correctness of the claim that adjectives and verbs are members of the same lexical category, a claim which I will not further justify in this paper, but will assume is correct. It should be obvious, however, that to accept this claim is not to maintain that verbs and adjectives behave identically in all respects, but only that their deep similarities outweigh their superficial differences in syntactic behavior.

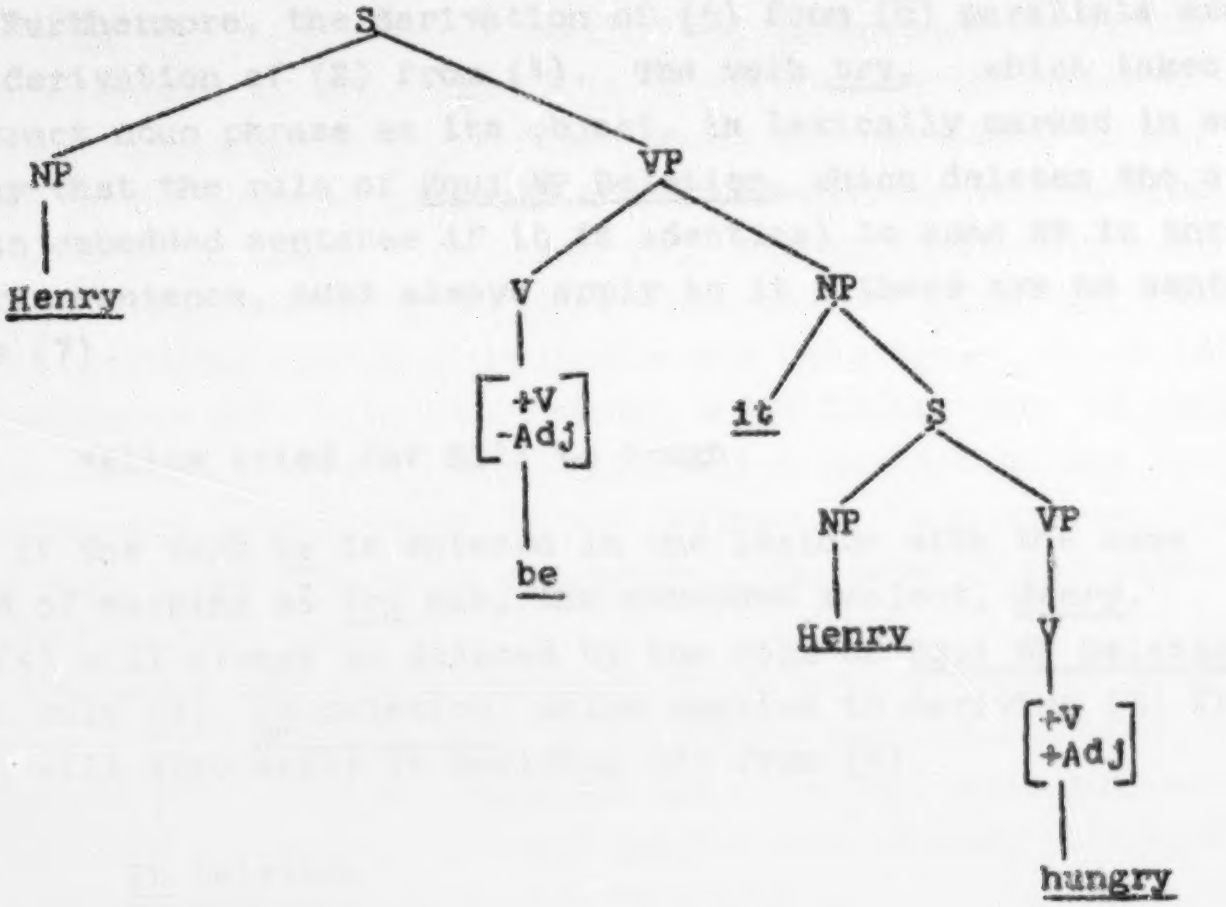
There are many American Indian languages (such as Mohawk and Hidatsa) and African languages (such as Gã, the language of Ghana) which do not exhibit the main syntactic feature which differentiates adjectives and verbs in English, i.e., the fact that the former are always preceded in simple sentences by the copula, be. In such languages, sentences like (2) are expressed by a word-for-word equivalent of (3).

(2) Henry is hungry.

(3) #Henry hungries.

The question I wish to discuss is the following: in languages exhibiting the copula, what is the deep structure of sentences like (2), which contain predicate adjectives?. And what is the status of the copula be in these languages? Is it merely an empty morpheme, which has been inserted by a transformational rule to "carry" tense and person inflections? Or is it instead present in the deep structure of (2)?

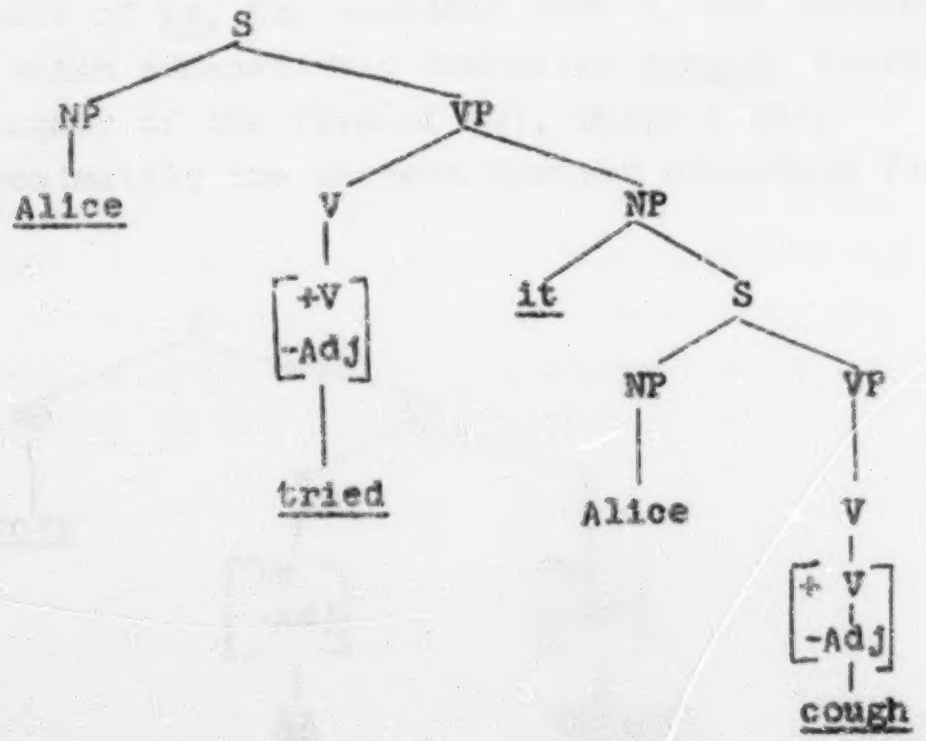
I wish to argue for this latter possibility, and to claim that the deep structure of (2) is roughly that shown in (4) (I use the feature specification [+V] to designate the lexical category of predicate): Note that (4) contains as an embedded sentence the structure which would underly (3):



I am claiming, therefore, that the underlying structure of (2) is in all significant respects exactly parallel to (6), which is the underlying structure of (5).

(5) Alice tried to cough.

(6)



Furthermore, the derivation of (5) from (6) parallels exactly the derivation of (2) from (4). The verb try, which takes an abstract noun phrase as its object, is lexically marked in such a way that the rule of Equi NP Deletion, which deletes the subject of an embedded sentence if it is identical to some NP in the matrix sentence, must always apply to it - there are no sentences like (7).

(7) *Alice tried for Bill to cough.

If the verb be is entered in the lexicon with the same kind of marking as try has, the embedded subject, Henry, in (4) will always be deleted by the role of Equi NP Deletion. Then rule (8), It-Deletion, which applies in deriving (5) from (6), will also apply in deriving (2) from (4).

(8) It Deletion

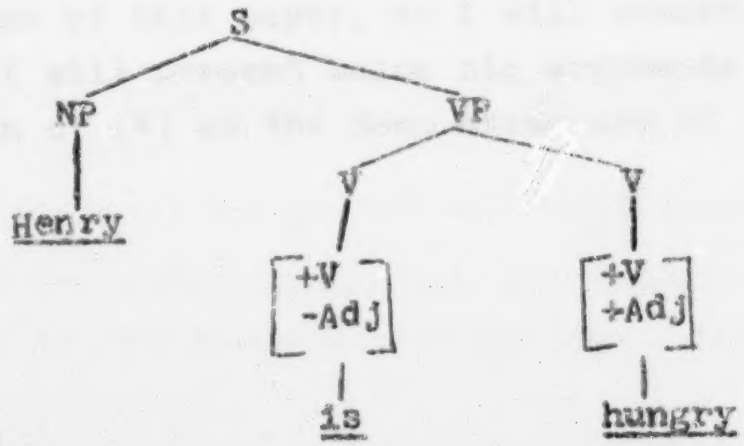
$$X - \left[\underline{\text{it}} - S\right]_{NP} - Y$$

$$1 \quad 2 \quad 3 \quad 4 \Rightarrow \text{OBLIG}$$

$$1 \quad 0 \quad 3 \quad 4$$

Various automatic conventions of tree-pruning[2] will delete several non-terminal nodes in (4): The node NP which dominates the object of be, the embedded node S, and possibly also the node VP which exhaustively dominates hungry, leaving a derived tree roughly of the form of (9), which I will assume to be approximately the correct derived structure for sentence (2).

(9)



Thus far I have shown that if (4) is assumed to be the deep structure of (2), and if *be* is entered in the lexicon with the same markings as *try*, rules which are necessary in any event in the grammar of English and conventions of tree-pruning can be used to convert (4) into (9), the approximately correct derived structure of (2). But I have not yet given any evidence which motivates assuming as abstract a deep structure as (4) for sentence (2). In other words, while it may well be *feasible* to derive (2) from (4), and while such a derivation may not engender any complication in the grammar, I have not yet shown that such a derivation is *necessary*. The rest of the paper is devoted to this end.

There are two claims implicit in (4) which require motivation: (i) the claim that *be* is a true *verb* (i.e., that it is marked $\begin{bmatrix} +\ V \\ -\ Adj \end{bmatrix}$ in the lexicon, and that this verb is present in the deep structure, and not merely some transformationally introduced morpheme whose only function is to carry tense and person inflections, or some totally different phrase structure category, *Copula*, which is not related at all to lexical verbs and adjectives, and (ii) the claim that this verb *be* takes an abstract NP as its object in the deep structure, and is thus deep structurally similar to such lexical items as *try*, *know*, *believe*, *want*, etc. Claims (i) and (ii) above are relatively independent: even if the second claim is correct, the first might be wrong. Even if I can show that the morpheme *be* must be followed by an abstract NP, it might still be argued that it should be dominated by the phrase structure node *Copula* instead of the feature bundle $\begin{bmatrix} +\ V \\ -\ Adj \end{bmatrix}$, or that it is not present in the deep structure. There are arguments which support the stronger claim, (i), but they are detailed and beyond the scope of this paper, so I will concentrate only on claim (ii).[3] I will present below six arguments which support the postulation of (4) as the deep structure of (2).

I. In many languages, pro-forms which replace adjectives are morphologically identical to pro-forms which replace abstract noun phrases. Thus in German, just as (10a) may be converted into (10b), so (11a) may be converted into (11b).

(10) a. Peter hat gewusst, dass es regnen würde, aber Anna hat nicht gewusst, dass es regnen würde.
'Peter knew that it would rain, but Anna didn't know that it would rain.'

b. Peter hat gewusst, dass es regnen würde, aber Anna hat es nicht gewusst.
'Peter knew that it would rain, but Anna didn't know it.'

(11) a. Peter ist klug, aber die Frauen sind nicht klug.
'Peter is smart, but the women aren't smart.'
b. Peter ist klug, aber die Frauen sind es nicht.
'*Peter is smart, but the women aren't it.'[4]

The same facts obtain for French: just as (12a) may be converted into (12b), so (13a) may be converted into (13b).

(12) a. Pierre savait qu'il allait pleuvoir, mais Anne ne savait pas qu'il allait pleuvoir.
'Peter knew that it was going to rain, but Ann didn't know that it was going to rain.'

b. Pierre savait qu'il allait pleuvoir, mais Anne ne le savait pas.
'Peter knew that it was going to rain, but Ann didn't know it.'

(13) a. Pierre est intelligent, mais les femmes ne sont pas intelligentes.
'Peter is intelligent, but the women aren't intelligent.'
b. Pierre est intelligent, mais les femmes ne le sont pas.
'*Peter is intelligent, but the women aren't it.'

If the rule which converts (10a) into (10b) and (12a) into (12b) is formulated as in (14),

(14) Sentence Deletion

$$X - S - Y - \left[\left[\begin{matrix} +\,N \\ +\,Pro \\ +\,Abstract \end{matrix} \right] - S \right]_{NP} - Z$$

$$1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \Longrightarrow Opt$$

$$1 \quad 2 \quad 3 \quad 4 \quad 0 \quad 6$$

Condition: 2 = 5

then this same rule will also operate to derive (11b) and (13b) from (11a) and (13a) respectively, if a deep structure similar to (4) is assumed to underly sentences (11) and (13).

The English glosses of (10a) and (10b) show that rule (14) operates in the grammar of English, but for some mysterious reason, the pronoun *it* cannot function as a pro-adjective except after the verb *look*, and after certain non-finite forms of the verb *be*.

(15)a. Harry is smart, although he doesn't look it.
b. People want me to be polite, but being it is often difficult.[5]

There are other less restricted pro-adjectives in English which are morphologically identical to pronouns - in (16), the pronoun *that* clearly substitutes for the adjective *beautiful*.

(16) They said that Sheila was beautiful, and that she is.

Thus the facts of sentences (10) - (13) and (15) - (16) support the analysis in (4), for if no NP follows the verb *be*, both the rule of Sentence Deletion and the rule which introduces the pronoun *that* will have to be made more complicated.

II. Consider next non-restrictive relative clauses, such as the embedded clause in (17).

(17) This table, which was made in Ireland, is very strong.

There is good evidence which indicates that such clauses are derived from conjoined sentences by a rule which adjoins one of the conjoined sentences to some NP in the other.[6] Thus, the structure underlying (18a) is first converted to the one underlying (18b) and finally to the one underlying (17).

(18) a. This table is very strong and this table was made in Ireland.

b. This table, and it was made in Ireland, is very strong.

The fact that the rules which form non-restrictive relative clauses *only embed conjoined* sentences onto noun-phrases thus indicates that at the stage of the derivation of (19) at which the non-restrictive clause which she was is adjoined to the adjective beautiful, that adjective must be dominated by the node NP.

(19) That Sheila was beautiful, which she was, was not realized until later.

The clause which she was in (19) should not be confused with sentential relative clauses, such as the embedded clauses in (20).

(20) Sheila was beautiful, { which was too bad / which Tom refused to admit } .

Sentential relative clauses, like which was too bad, can be inserted after beautiful in (19) in place of the clause which she was, and grammatical sentences will result. In fact, it is always the case that sentential relatives, like those in (20) can replace non-restrictive relative clauses which have been adjoined to adjectives, but the converse is not true, as (21) shows.

(21) That it had rained, {which was too bad / which Tom refused to admit / *which she was}, was not known

The ungrammaticality of (21), if the clause which she was is present, clearly shows that this clause is different from the two sentential relatives, and that this clause can in fact only be adjoined to adjectives, as I claimed above. But since the clause which she was is clearly a non-restrictive, and since the rules which form non-restrictive clauses are most simply formulated if these clauses are only adjoined to noun phrases, the existence of such sentences as (19) and general considerations of simplicity provide strong evidence for the correctness of the claim that (4) is the correct deep structure of (2).

III. A detailed description of the grammar of pseudo-cleft sentences, i.e., sentences such as those in (22),

(22) What fell down was the table.
What I didn't know was that the earth is flat.
What I hate is having to write papers.
The one who killed Caesar was Brutus.
Where I want to sleep is under the bed.
The reason that I got up was because I was hungry.

would reveal that such sentences are most simply accounted for if the constituents which follow the verb be are analyzed as noun phrases.[7] This means, for example, that in (22) the phrases the table, that the earth is flat, having to write papers, Brutus, under the desk, and because I was hungry are all to be analyzed, not too surprisingly, as being noun phrases. And since there exist such sentences as (23),

(23) What Marcus has never been is courageous.

by the same criterion, the adjective courageous must be dominated by the node NP at some point in the derivation of (23), unless the rule which forms pseudo-cleft sentences is to be made more complex in some way. But if (4) is in fact the correct analysis of predicate adjectives, it is not necessary to complicate the statement of the pseudo-cleft rule in any way in order for (23) to be generated.

IV. Now consider equative sentences, which contain colons, like sentence (24).

(24) I've had enough: either the cat goes or I go.

When equative sentences only differ by one NP, the rule given in (25), Equative Deletion, optionally deletes the repeated part of the sentence which follows the colon.

(25) Equative Deletion

X - NP - Y- : X - NP - Y

1 2 3 4 5 6 7 ⇒ Opt

1 2 3 4 0 6 0

This rule optionally transforms the a versions of sentences (26) - (28) to their b versions.

(26) a. Rodney built [what I wanted him to build]$_{NP}$: he built [a golden igloo]$_{NP}$.

b. Rodney built [what I wanted him to build]$_{NP}$: [a golden igloo]$_{NP}$.

(27) a. He knows [something he won't admit]$_{NP}$: he knows [that the war is futile]$_{NP}$.

b. He knows [something he won't admit]$_{NP}$: [that the war is futile]$_{NP}$.

(28) a. Billy slept [where I would never sleep] $_{NP}$; he slept [under the desk] $_{NP}$.

b. Billy slept [where I would never sleep] $_{NP}$; [under the desk] $_{NP}$

In fact, the phrases which can appear after the verb be in pseudo-cleft sentences are the same as the phrases which can follow the colon in sentences like (26)-(28). This includes adjectives, as might be expected.

(29) a. Tom is [what his brother never will be] $_{NP}$; Tom is [totally fearless] $_{NP}$

b. Tom is [what his brother will never be] $_{NP}$; [totally fearless] $_{NP}$

The fact that (29b) is grammatical indicates that the phrase totally fearless must be dominated by NP in (29a) so that Equative Deletion can apply to convert (29a) into (29b). Once again, this fact supports the analysis I proposed at the beginning of this paper.

V. In German, there is a rule of Topicalization which optionally moves to the front of a sentence some NP contained in that sentence. This rule, stated roughly in (30),

(30) Topicalization

X	-	NP	-	Y		
1		2		3	⇒	Opt
2		1		0		3

converts the structures underlying the a versions of (31)-(33) into the structures underlying the corresponding b versions.

(31) a. Wir haben [Bohnen] $_{NP}$ gegessen.

b. [Bohnen] $_{NP}$ haben wir gegessen

'We ate beans.'

(32) a. Ich wollte [$_{NP}$ unter dem Schreibtisch] schlafen.

b. [Unter dem Schreibtisch]$_{NP}$ wollte ich schlafen.

'I wanted to sleep under the desk.'

(33) a. Er hat die Bohnen [genüsslich]$_{NP}$ gegessen.

b. [Genüsslich]$_{NP}$ hat er die Bohnen gegessen.

'He ate the beans with great enjoyment.'

Again, to go deeply enough into the details of German syntax to justify sufficiently the formulation of the rule of Topicalization that I have given in (30) would take me beyond the scope of this paper, but if it is assumed to be correct, then the fact that adjective phrases too, like stolz auf dich can be topicalized (cf. (34b)),

(34) a. Dein Vater muss [stolz auf dich] sein.

b. [Stolz auf dich]$_{NP}$ muss dein Vater sein.

'Your father must be proud of you.'

provides further evidence for the correctness of the analysis of predicate adjectives implicit in (4).

VI. Finally, let us examine the Question Formation rule in English: (35) contains an approximate statement of this rule.

(35) Question Formation

Q	-	X	-	NP	-	Y		
1		2		3		4	→	Oblig
1	3	2		0		4		

Condition: 3 dominates WH + some

This rule must be restricted as follows: if the NP in term 3 of (35) starts a larger NP, the smaller NP cannot be moved, and the transformation must instead move the larger NP to the front of the sentence. Thus when rule (35) applies to (36a), this restriction will prevent the generation of the ungrammatical (36b), while allowing the grammatical (36c) to be generated.

(36) a. Q you are reading $[_{NP}[_{NP}$WH + somebody's$]_{NP}$ book$]_{NP}$

b. *Whose are you reading book?

c. Whose book are you reading?

Now notice that an exactly similar situation obtains when a preposed adverb of degree is questioned from in front of an adjective. It seems likely that the question word how should be analyzed as deriving from the NP to what extent. If this is correct, and if (4) is the correct underlying structure for (2), then the facts of (37) are explained without any further conditions having to be stated on the rule of Question Formation.

(37) a. Q John is $[_{NP}$ [to WH + some extent$]_{NP}$ old$]_{NP}$

b. *How is John old?[8]

c. How old is John?

If a NP underlies the word how in (37c), and if the phrase how old is also a NP, then the ungrammaticality of (37b) (in the intended sense) is accounted for by the same restriction which is necessary in any event to exclude (36b). But how old can only be dominated by NP if the analysis of predicate adjectives implicit in (4) is assumed. Hence the parallelism of (36) and (37) also supports the analysis I have proposed.

To summarize: in the first part of this paper, I argued that if (4) were assumed to be the deep structure of (2),

Henry is hungry, no additional apparatus would have to be added to the grammar of English to convert (4) into (9), the approximately correct surface structure of (2): the derivation would parallel exactly the derivation of such sentences as (5), Alice tried to cough. In the second half of the paper I presented six arguments from widely varying areas of syntax which seem to me to necessitate the analysis which the first part of the paper showed to be feasible.

FOOTNOTES

1.

This paper was presented at the Winter Meeting of the Linguistic Society of America, which was held in New York on December 28, 1966. This work was supported in part by the Joint Services Electronics Program under Contract DA 36-039-AMC-03200(E); in part by the National Science Foundation (Grant GF-2495), the National Institutes of Health (Grant MH-04737-05), the National Aeronautics and Space Administration (Grant NsG-496), and the U.S. Air Force (ESD Contract AF 19(628)-2487).

I am indebted to Morris Halle, to Paul and Carol Kiparsky, and to George Lakoff, for many helpful criticisms and suggestions.

2.

For a description of a convention which prunes the node S under certain conditions, see my "A proposed rule of tree-pruning", Report No. NSF-17 Mathematical Linguistics and Automatic Translation, the Computation Laboratory of Harvard University, Cambridge, Massachusetts, 1966.

3.

Some of the arguments which support claim (1) are presented in my dissertation, Universal Constraints on Variables in Syntactic Rules, M.I.T. (in preparation).

4.

At present I have no explanation for the fact that the English gloss of (11b) is ungrammatical.

5. I am grateful to Dwight Bolinger for calling my attention to this example.

6. Cf. George Lakoff, Deep and Surface Grammar, Chapter 1, M.I.T. Press (to appear).

7. To demonstrate this here would go beyond the scope of this paper - many arguments supporting this claim are given in my dissertation (op. cit. fn. 3).

8. I have starred (37b), not because it is ungrammatical in all senses (for it is a perfectly acceptable variant of In what respect is John old?), but rather because it is clearly not related to (37c).